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EXAMINER

KAO, CHIH CHENG G

ART UNIT

PAPER NUMBER

2882

DATE MAILED: 06/17/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/802,168

Applicant(s)

SAIDA ET AL.

Examiner

Chih-Cheng Glen Kao

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 24 March 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 March 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1 and 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. (US Patent 5010346) in view of Paiam (US Patent 6421478), Okugawa et al. (JP 11-055320), and Tachikawa et al. (US Patent 5414548).
2. Regarding claim 1, Hamilton et al. discloses an optical signal processing device (Fig. 1) comprising an input optical waveguide (Fig. 1, #18), an optical splitter after the input (Fig. 1, #20), an optical delay waveguide array after the splitter (Fig. 1, #32), an optical combiner (col. 6, lines 9-14), output optical waveguides (Fig. 1, #46, 48, 50, 52, and 54).

However, Hamilton et al. does not disclose a combiner after a delay array, an output waveguide into a port, and optical gates off the substrate, amplitude adjustment of the array to a different intensity, or silica-based waveguides.

Paiam teaches the combiner (Fig. 2a, #12) and an output waveguide into a port (Fig. 2a, #4). Okugawa et al. teaches optical gates off a substrate (Fig. 1, #5 and 6). Tachikawa et al. teaches amplitude adjustment of the array (Fig. 8, #95) to a different intensity (inherent) and silica-based waveguides (col. 8, lines 39-45).

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have the combiner and port of Paiam with the device of Hamilton et al., since one would be motivated to use it for routing and directing optical signals as implied from Paiam (col. 4, lines 56-60).

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have the optical gates of Okugawa et al. with the device of Hamilton et al. since one would be motivated to have it for controlling the optical signals and letting only certain signals through as implied from Okugawa et al. (Abstract, Solution).

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have the amplitude adjustment of Tachikawa et al. with the device of Hamilton et al., since one would be motivated to amplify to compensate for the loss in signal intensity as implied from Tachikawa et al. (col. 11, lines 1-2).

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have silica based waveguides of Tachikawa et al. with the device of Hamilton et al., since one would be motivated to incorporate it with the device thus saving on manufacturing costs as implied from Tachikawa et al. (col. 8, lines 39-45).

3. Regarding claims 3 and 4, Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., suggests a device as recited above.

However, Hamilton et al. does not disclose the waveguides, splitter, array, combiner, and gate on a substrate, and a gate between the combiner and output off the substrate.

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Tachikawa et al. further teaches waveguides, array, and combiner on a substrate (Fig. 5). Okugawa et al. teaches optical gates off a substrate (Fig. 1, #5 and 6).

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have the waveguides, array, and combiner of Tachikawa et al. along with the splitter and gate on the substrate with the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., since rearranging parts of an invention involves routine skill in the art. One would be motivated to have all the parts on the substrate to keep the components together to conserve space and provide support to the components.

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have the optical gates of Okugawa et al. with the device of Hamilton et al. since one would be motivated to have it for controlling the optical signals and letting only certain signals through as implied from Okugawa et al. (Abstract, Solution). Secondly, it would have been obvious, to one having ordinary skill in the art to have the gate off the substrate, since rearranging parts of an invention involves routine skill in the art.

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have to have the gate between the combiner and output with the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., since rearranging parts of an invention involves routine skill in the art. One would be motivated to have this arrangement to conserve on costs and have one optical gate instead of many as seen in Okugawa et al. (Fig. 1, #6).

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4. Regarding claim 5, Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., suggests a device as recited above.

However, Hamilton et al. does not disclose optical gate elements.

Okugawa et al. further teaches optical gate elements (Fig. 1, #5 and 6).

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have the optical gate elements of Okugawa et al. with the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., since one would be motivated to have it for controlling the optical signals and letting only certain signals through as implied from Okugawa et al. (Abstract, Solution).

5. Regarding claim 6, Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., suggests a device as recited above.

However, Hamilton et al. does not disclose phase controllers on the waveguides after gate elements.

Paiam teaches phase controllers on the waveguides.

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have the phase controllers of Paiam with the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., since one would be motivated to use it for tuning the array into different functions as implied from Paiam (col. 11, lines 13-22).

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have the phase controllers after gate elements with the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., rearranging parts of an

invention involves routine skill in the art. One would be motivated to have the phase controllers after gate elements to create even more path length changes after the delay array as implied from Paiam (col. 12, lines 22-41).

6. Regarding claim 7, Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., suggests a device as recited above.

However, Hamilton et al. does not disclose amplitude adjustment of the array to a different intensity.

Tachikawa et al. teaches amplitude adjustment of the array (Fig. 8, #95) to a different intensity (inherent).

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have the amplitude adjustment of Tachikawa et al. with the device of Hamilton et al., since one would be motivated to amplify to compensate for the loss in signal intensity as implied from Tachikawa et al. (col. 11, lines 1-2).

7. Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. as applied to claim 1 above, and further in view of Duguay et al. (US Patent 3838278).

Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., suggests a device as recited above.

However, Hamilton et al. does not disclose digital-to-analog converted value of the optical signals.

Duguay et al. teaches digital-to-analog converted value of the optical signals (col. 3, lines 23-25).

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have the digital-to-analog converted value of the optical signals of Duguay et al. with the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., since one would be motivated to have these conversions to make this compatible with either existing electronic transmission systems or with future optical transmission systems (col. 1, lines 40-44) as implied from Duguay et al.

8. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. as applied to claim 1 above, and further in view of Ishida et al. (US Patent 5937117) and Inoue et al. (US Patent 5546483).

Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., suggests a device as recited above.

However, Hamilton et al. does not disclose a Mach-Zehnder switch with a thin film heater as the amplitude controller or a thin film heater as an optical modulator.

Ishida et al. teaches a Mach-Zehnder switch with a thin film heater as the amplitude controller (col. 8, lines 66-67, and col. 9, lines 1-5). Inoue et al. teaches a thin film heater as an optical modulator (col. 14, lines 60-65).

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have the Mach-Zehnder switch or Ishida et al. with the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., since one would be



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motivated to use it as a selector to determine which signals get through as implied from Ishida et al. (col. 8, lines 57-67).

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have thin film heater of Inoue et al. with the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., since one would be motivated to use it to adjust light to satisfy a certain relative phase condition as implied from Inoue et al. (col. 15, lines 12-15).

9. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. as applied to claim 1 above, and further in view of Kito et al. (JP 09-258045).

Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., suggests a device as recited above.

However, Hamilton et al. does not disclose a multi-mode interference optical coupler.

Kito et al. teaches a multi-mode interference optical coupler (Abstract, Solution).

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have the coupler of Kito et al. with the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., since one would be motivated to use it for super-high speed optical transmission in optical communication systems as implied from Kito et al. (Abstract, Problem to be Solved).

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10. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al. as applied to claim 1 above, and further in view of Inoue et al.

Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., suggests a device as recited above.

However, Hamilton et al. does not disclose a TE/TM converter.

Inoue et al. teaches a TE/TM converter (col. 16, lines 1-10).

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have TE/TM converter of Inoue et al. with the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., since one would be motivated to achieve polarization-independent operation and reduce birefringence as implied from Inoue et al. (col. 15, lines 54-67).

11. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. in view of Paiam, Okugawa et al., Tachikawa et al., and Amersfoort et al. (US Patent 5748811).

For purposes of being concise, Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., suggests a device as recited above.

However, Hamilton et al. does not a switch and second array or identical timing.

Amersfoort et al. teaches a switch and second array (Fig. 14, #174, 176, and 178).

Okugawa et al. shows identical timing (Abstract, Solution).

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have the switch and second array of Amersfoort et al. with the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., since one would be motivated to have switching to create networks where signals are switched among fibers without the necessity of converting the signal to electrical form as implied from Amersfoort (col. 1, lines 25-30).

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have the identical timing of Okugawa et al. with the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., since one would be motivated to have identically separate timing to keep the signals from getting mixed as implied from Okugawa et al. (Abstract, Solution).

12. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. in view of Paiam, Okugawa et al., Tachikawa et al., and Amersfoort et al. as applied to claim 11 above, and further in view of Ishida et al.

Hamilton et al. in view of Paiam, Okugawa et al., Tachikawa et al., and Amersfoort et al. suggests a device as recited above.

However, Hamilton et al. does not disclose a Mach-Zehnder switch with a thin film heater.

Ishida et al. teaches a Mach-Zehnder switch with a thin film heater (col. 8, lines 66-67, and col. 9, lines 1-5).

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have the Mach-Zehnder switch or Ishida et al. with the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., and Tachikawa et al., since one would be motivated to use it as a selector to determine which signals get through as implied from Ishida et al. (col. 8, lines 57-67).

13. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. in view of Paiam, Okugawa et al., Tachikawa et al., and Amersfoort et al. as applied to claim 11 above, and further in view of Kito et al. (JP 09-258045).

Hamilton et al. in view of Paiam, Okugawa et al., Tachikawa et al., and Amersfoort et al. suggests a device as recited above.

However, Hamilton et al. does not disclose a multi-mode interference optical coupler.

Kito et al. teaches a multi-mode interference optical coupler (Abstract, Solution).

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have the coupler of Kito et al. with the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., Tachikawa et al., and Amersfoort et al. since one would be motivated to use it for super-high speed optical transmission in optical communication systems as implied from Kito et al. (Abstract, Problem to be Solved).

14. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hamilton et al. in view of Paiam, Okugawa et al., Tachikawa et al., and Amersfoort et al. as applied to claim 11 above, and further in view of Inoue et al.

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Hamilton et al. in view of Paiam, Okugawa et al., Tachikawa et al., and Amersfoort et al. suggests a device as recited above.

However, Hamilton et al. does not disclose a TE/TM converter.

Inoue et al. teaches a TE/TM converter (col. 16, lines 1-10).

It would have been obvious one having ordinary skill in the art at the time the invention was made, to have TE/TM converter of Inoue et al. with the suggested device of Hamilton et al. in view of Paiam, Okugawa et al., Tachikawa et al., and Amersfoort et al., since one would be motivated to achieve polarization-independent operation and reduce birefringence as implied from Inoue et al. (col. 15, lines 54-67).

### ***Response to Arguments***

15. Applicant's arguments filed 3/24/03 have been fully considered but they are not persuasive.

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a purely optical device that operates entirely in an optical region) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chih-Cheng Glen Kao whose telephone number is (703) 605-5298. The examiner can normally be reached on M - Th (8 am to 5 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9318 for regular communications and 703-872-9319 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



gk  
June 9, 2003



DAVID V. BRUCE  
PRIMARY EXAMINER